Oct. 20, 1925. 1,557,607

E. J. OVINGTON

COMBINED RIM STRETCHER AND FRAME BENDER

Filed Aug. 8, 1923

Fig 1

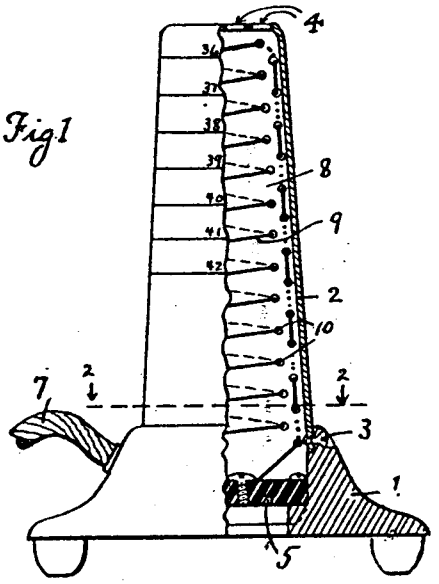


Fig 3

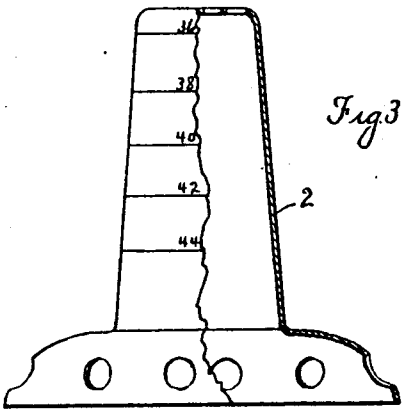


Fig 2

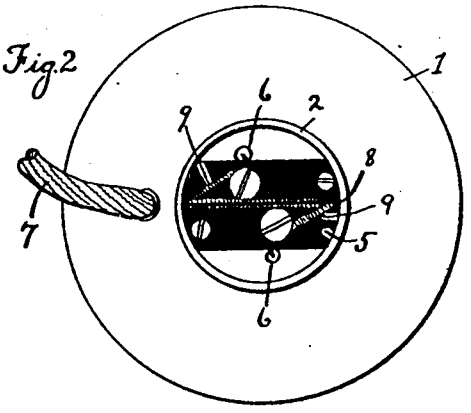
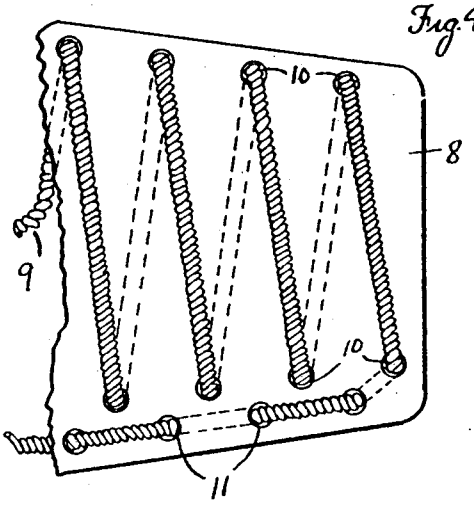


Fig 4



WITNESSES,
Jennette C. Stumpf
Geo B Rawlings.

INVENTOR,
Edward J Ovington.
BY Ellis Spear Jr.
ATTORNEY.

Patented Oct. 20, 1925. 1,557,607

UNITED STATES PATENT OFFICE.

EDWARD J. OVINGTON, OF AUBURNDALE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOSEPH W. CROWELL, OF NEWTON CENTER, MASSACHUSETTS.

COMBINED RIM STRETCHER AND FRAME BENDER.

Application filed August 8, 1923. Serial No. 656,362.

To all whom it may concern:

Be it known that I, EDWARD J. OVINGTON, a citizen of the United States, residing at Auburndale, county of Middlesex, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Combined Rim Stretchers and Frame Benders, of which the following is a specification.

This invention relates to a combined rim stretcher and frame bender for stretching, bending and shaping the rims, nose bridge, temples and other parts of spectacles, eye glasses, etc. For the purposes of this application I shall discuss my invention in its relation to the familiar spectacles or eyeglass frames of zylonite, although it will be understood that such treatment is purely illustrative and in no way limiting. The various parts of the zylonite frame may be stretched, bent, and shaped by heating the zylonite sufficiently to soften it.

Various forms of heaters have been devised for this purpose of which the most satisfactory has been an internally heated frusto-conical shell over which the rims are adapted to be slipped and progressively moved therealong until stretched to the desired degree. In such prior devices, however, so far as I am aware, no provision has been made for uniformly distributing the heat, with the result that the temperature of the shell varies at different points throughout its extent. Such variations in temperature makes for uncertainty in stretching the rims. Moreover, in such prior devices no suitable means have been provided for a combination of the above feature with a rising column of heated air, over which the zylonite frame may be held to permit bending, shaping and forming the different parts of the frame, more especially the nose bridge and temples.

To the end therefore, of providing a heater of the class indicated in which a rising column of hot air will be produced and in which the heat will be distributed uniformly throughout the extent of the heater, I have devised my present invention. While in certain broader aspects my device may be variously heated, as by some outside, independent heating means, either electrical or otherwise, I prefer wherever possible to heat electrically, by means of my improved electrical heating unit hereinafter described, although I do not wish to limit myself to this means. Where an electric heater is used, I secure a considerably increased resistance in a relatively short winding by the use of a special resistance unit.

The construction and manner of assembling and using my heater, together with selected embodiments thereof which well illustrates the principles involved, are described and shown in the accompanying specification and drawings, and the characteristic features of novelty are particularly pointed out in the appended claims. Throughout the specification and drawings like reference characters are correspondingly applied. In the drawings:

Fig. 1 is an elevation, partly in section, of an electric heater in accordance with my invention.

Fig. 2 is a plan section on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 and showing a modification to be used with separate, detached heating means, and

Fig. 4 is an enlarged detail view of the resistance unit shown in Fig. 1.

Referring to Figs. 1 and 2, I have indicated at 1 a footed base and at 2 a frustro-conical shell seated within and detachably clamped at 3 within said base. The shell may be graduated exteriorly as indicated in Fig. 1 and the upper end thereof is preferably perforated as indicated at 4, Fig. 1. Set within the base 1 is a bridge piece 5 of suitable insulating material, to which the terminals 6 of the lead wires 7 are connected. Mounted upon the bridge piece 5 is the resistance unit which, as here shown, consists of an insulating plate 8 of mica or the like across which the resistance wire 9 is threaded from end to end thereof. The plate 8 tapers upwardly from bottom to top in approximate conformation with the taper of the shell 2, and at its opposite edges is provided with converging rows of holes 10 through which the resistance wire is threaded in a series of spaced superposed turns of gradually decreasing diameter from bottom to top. The decrease in diameter of the turns of wire corresponds with the decrease in diameter of the shell itself so that the effective heating surface of the wire at any point along the shell is proportioned to the diameter of the shell at that point, thus insuring a uniform genera-

tion and distribution of the heat. After the series of turns has been made in the wire, the free end of the wire is brought down one edge of the plate through a series of holes 11, see Fig. 4, both ends of the wire then being connected to the terminals 6 of the lead wires 7.

As shown herein, the resistance winding is a coiled wire. Such a winding possesses considerably greater resistance per unit of length, as compared with the ordinary straight uncoiled winding. In practice, the relation is approximately 7 to 1, that is to say, one lineal inch of coiled winding is the equivalent in length and therefore in resistance of approximately seven inches of straight uncoiled wire. This increased resistance in a relatively short winding is very important where high resistance windings have to be made in a small space. Moreover, the coiled winding possesses advantages over the straight winding in respect to the matter of assembling the winding upon the insulating plate.

With my winding, each turn is put under tension when it is threaded through the staggered holes of the insulating plate. This insures that the winding will closely hug the insulating plate and that the turns thereof will be separated from each other at the holes in the plate. After assembling, the terminal ends of the coiled wire may be stretched to any required length for connection with the terminals 6 of the lead wires 7 without displacing the rest of the winding. This avoids the necessity of exercising extreme care in threading the wire through the holes to make sure that the ends thereof are the proper length, as is necessary with a straight, uncoiled wire which cannot be stretched.

In using this form of my heater, the frames of zylonite or other material are slipped onto the frustro-conical shell from above and are moved downwardly until stretched to the desired degree. The radiant heat from the resistance unit is distributed uniformly throughout the length of the shell. The air contained within the shell is also heated and, rising, causes the shell to be heated more quickly and more uniformly than if the heat were applied in some other way, as for example, to an unperforated shell. Moreover the perforations 4 at the top of the shell make this rising column of heated air available for bending and shaping the nose bridge, temples and other parts of the spectacles or eyeglasses held over said perforations.

In the form of my invention shown in Fig. 3, I use a relatively short shell which may be conveniently combined with outside, independent heating means, as an electric, gas, alcohol or other heater.

Various other modifications in the form and construction of my device may obviously be resorted to without departing from the spirit of my invention, if within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. A heater for stretching annular pieces, comprising an upwardly tapering shell over which the pieces to be stretched are adapted to be slipped from above and moved downwardly until stretched to the desired degree, a mount for a resistance unit extending centrally of said shell from end to end thereof and tapered to substantially correspond to the taper of said shell and having adjacent its lateral edges rows of relatively staggered upwardly converging spaced threading holes, and a resistance wire coiled about itself in a plurality of closely laid turns adapted to be threaded through and frictionally retained within said threading holes in a series of superposed turns of progressively decreasing diameter from the lower towards the upper end of the mount whereby to heat the column of air contained in the shell and to uniformly heat the shell throughout its extent.

2. A heater for stretching annular pieces, comprising a tapered shell over which the pieces to be stretched are adapted to be slipped from one end and moved therealong until stretched to the desired degree, a mount for a resistance unit extending centrally of said shell from end to end thereof and tapered to substantially correspond to the taper of said shell and having adjacent its lateral edges rows of relatively staggered converging spaced threading holes, and a resistance wire coiled upon itself in a plurality of closely laid turns adapted to be threaded through and frictionally retained within said threading holes in a series of superposed turns of progressively decreasing diameter from one end towards the opposite end of the mount whereby to uniformly heat the shell and the column of air contained therein throughout its extent, the free ends of said coiled wire when assembled upon said mount being stretchable without displacement of the main body portion of the wire retained within said threading holes.

3. A heater for stretching annular pieces, comprising a tapered shell over which the pieces to be stretched are adapted to be slipped from one end and moved therealong until stretched to the desired degree, a mount for a resistance unit extending centrally of said shell from end to end thereof and tapered to substantially correspond to the taper of said shell and having adjacent its lateral edges rows of relatively staggered converging spaced threading holes, and a resistance wire coiled upon itself in a plurality of closely laid turns adapted to be

threaded through and frictionally retained within said threading holes in a series of superposed turns of progressively decreasing diameter from one end towards the opposite end of the mount whereby to heat the column of air contained in the shell and to uniformly heat the shell throughout its extent.

4. A heater for stretching annular pieces, comprising a shell over which the pieces to be stretched are adapted to be slipped, a mount for a resistance unit extending centrally of said shell from end to end thereof and having adjacent its lateral edges rows of relatively staggered spaced threading holes, and a resistance wire adapted to be threaded through and frictionally retained within said threading holes for heating the column of air contained in the shell and for uniformly heating the shell throughout its extent.

5. A heater for stretching annular pieces, comprising an upwardly tapering shell over which the pieces to be stretched are adapted to be slipped from above and moved downwardly until stretched to the desired degree, a mount for a resistance unit extending centrally of said shell from end to end thereof and tapered to substantially correspond to the taper of said shell, and a resistance wire coiled upon itself in a plurality of closely-laid turns and extending across said mount in a series of superposed turns of progressively decreasing diameter from the lower towards the upper end of the mount for heating the column of air contained in the shell and for uniformly heating the shell throughout its extent.

6. A heater for stretching annular pieces, comprising a base and an upwardly tapering shell over which the pieces to be stretched are adapted to be slipped from above and moved downwardly until stretched to the desired degree, a mount for a resistance unit extending centrally of said shell from end to end thereof tapered to substantially correspond to the taper of said shell, and a resistance wire extending across said mount in a series of superposed turns of progressively decreasing diameter from the lower toward the upper end of the mount for heating the column of air contained in the shell and for uniformly heating the shell throughout its extent.

7. A heater for stretching annular pieces, comprising a tapered shell over which the pieces to be stretched are adapted to be slipped from one end and moved therealong until stretched to the desired degree, a mount for a resistance unit extending longitudinally within said shell from end to end thereof, and a resistance wire extending across said mount in a series of superposed turns of progressively decreasing diameter from one end towards the opposite end of the mount for heating the column of air contained in the shell and for uniformly heating the shell throughout its extent.

8. A heater for stretching annular pieces comprising an upwardly tapering shell over which the pieces to be stretched are adapted to be slipped from above and progressively moved downwardly until stretched to the desired degree, and an upwardly tapering heating unit arranged centrally within said shell and corresponding substantially to the taper thereof for uniformly heating the shell, the top of said shell being perforated and constituting a supporting surface upon which pieces to be bent may be laid for direct exposure to the rising column of heated air within the shell.

9. A heater for stretching annular pieces comprising a tapered shell over which the pieces to be stretched are adapted to be slipped from one end and progressively moved therealong until stretched to the desired degree, a tapered heating unit within said shell and corresponding substantially to the taper thereof for uniformly heating the shell throughout its extent.

10. A heater for stretching and forming pieces, comprising a shell open adjacent its top and bottom and over which the pieces to be stretched are adapted to be slipped from one end, and means for heating the rising column of air within said shell, the opening adjacent the upper end of the shell permitting dissipation of the heat generated by allowing the rising column of heated air to escape and said escaping column permitting pieces held within the influence thereof to be formed.

11. A heater for stretching and forming pieces, comprising a shell open adjacent its top and bottom and over which the pieces to be stretched are adapted to be slipped from one end, and means within said shell for heating the rising column of air within said shell, the opening adjacent the upper end of the shell permitting dissipation of the heat generated by allowing the rising column of heated air to escape and said escaping column permitting pieces held within the influence thereof to be formed.

12. In a heater of the class described, a shell and a heating unit therein, the top of said shell being perforated to permit escape of the rising column of heated air and said perforated top constituting a protecting surface for the heating unit.

13. A heater of the class described, comprising a shell and a resistance unit therein, the winding of said unit being formed as a coiled wire and the free ends of said coiled wire when assembled upon said unit being stretchable without displacement of the main body portion of the wire.

14. In a heater of the class described, a tapering shell adapted to be internally heat-

ed throughout its extent, the top of said shell being vented to permit the rising column of heated air within the shell to pass through said top and be available for bending and shaping parts held within said column.

15. In a heater of the class described, a shell adapted to be internally heated throughout its extent, and over which pieces to be stretched are adapted to be slipped from one end, the top of said shell being vented to permit the rising column of heated air within the shell to pass through said top and be available for bending and shaping parts held within said column.

16. In a heater of the class described, a tapering shell adapted to be heated uniformly throughout its extent, the top of said shell being perforated to permit the rising column of heated air within the shell to pass through said perforated top and be available for bending and shaping parts held within said column.

17. A device of the class described, comprising a tapered shell defining an air chamber vented adjacent its upper end, a means for heating the air within said air chamber, said heating means and said vent causing a rising column of heated air, which column is dissipated through said vent whereby to permit the shell to be quickly brought up to its point of constant temperature and to keep such point reasonably low.

In testimony whereof I affix my signature.

EDWARD J. OVINGTON.